SULFUR DIOXIDE REDESIGNATION REQUEST AND MAINTENANCE PLAN SIP REVISION FOR

BOYD COUNTY, KENTUCKY

LOCATED WITHIN THE KENTUCKY PORTION OF THE HUNTINGTON-ASHLAND, WV-KY-OH METROPOLITAN STATISTICAL AREA

Prepared by the
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Submitted by
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INTRODUCTION

The Commonwealth of Kentucky submits this redesignation request to the United States Environmental Protection Agency (U.S. EPA) in accordance with the requirements of the Clean Air Act Amendments of 1990. The redesignation request demonstrates how Kentucky will maintain compliance with the primary and secondary National Ambient Air Quality Standards (NAAQS) for SO_2 in that portion of Boyd County previously designated nonattainment.

BACKGROUND

In accordance with the Clean Air Act (CAA), a March 3, 1978, *Federal Register* notice designated Boyd County nonattainment for sulfur dioxide (SO_2) (*Appendix A*). The March 3, 1978 SO_2 nonattainment designation was based on modeling performed by the U.S. EPA and Kentucky, which indicated that both the annual and the 24-hour SO_2 NAAQS were being violated.

After completion of a one-year monitoring study conducted by Environmental Systems, Inc., for Ashland Oil Company, it was shown that the national ambient air quality standards (NAAQS) for SO_2 were being attained in the northern part of the county. In a November 2, 1979, *Federal Register* notice, the U.S. EPA revised the nonattainment designation area to that portion of Boyd County lying south of UTM Line 4251 km (*Appendix B*).

I. Attainment of the Standard

In order to determine that the portion of Boyd County that is designated nonattainment has attained the NAAQS for SO_2, the U.S. EPA requires air dispersion modeling data and ambient air monitoring data that demonstrate compliance.

a. **Ambient Monitoring** – Ambient air monitoring data for Kentucky, Ohio, and West Virginia are in *Appendix C*. No exceedances of the SO_2 NAAQS in Boyd County have occurred since monitoring began in 1975. For Ohio, the monitoring data indicate no exceedances of the SO_2 NAAQS since 1977. Finally, although there were several exceedances in West Virginia since 1983, there have been no exceedances of the SO_2 NAAQS in West Virginia since 1990. This indicates that not only Boyd County, but the entire multi-state area is in compliance with the standard.

b. **Modeling** – By letter dated October 20, 2003 to the U.S. EPA, Region IV, the Kentucky Division for Air Quality (KYDAQ) requested the use of an alternative model for redesignation of that portion of Boyd County that is currently classified as SO_2 nonattainment. The alternative requested was the AERMOD model (*Appendix D*). By letter dated November 12, 2003, U.S. EPA Region IV approved the use of the AERMOD model (*Appendix E*). U.S. EPA Regions 3 and 4, the KYDAQ, and the West Virginia Department of Environmental Protection (WVDEP) jointly developed air dispersion modeling for the Boyd County SO_2 nonattainment area. The modeling procedures applied in the demonstration of attainment for the Boyd County nonattainment area were based on the use of the American Meteorological Society (**A**MS)/United States Environmental Protection Agency (**E**PA) **R**egulatory **M**odel **I**mprovement **C**ommittee (AERMIC) **Mod**el (AERMOD). The modeling results are contained in *Appendix F*. A summary of the modeling results is listed in Table 1 below.

Table 1. Summary of SO_2 Modeling Results for Boyd County Nonattainment Area					
Averaging Period	**Rank**	**NAAQS (ug/m^3)**	**Max Modeled Concentration (ug/m^3)**	**Regional Background Concentration (ug/m^3)**	**Total Concentration (ug/m^3)**
3-hour	HSH	1300	1060.18	103.4	1163.58
24-hour	HSH	365	306.26	43.2	349.46
Annual	H	80	65.77	11.0	76.77

II. SIP Approval

This redesignation request complies with CAA §110 k requirements. These requirements are listed in detail in Section IV of this document, "Section 110 and Part D Requirements."

III. Permanent and Enforceable Improvement in Air Quality

The continued improvement and maintenance of air quality since 1975 in Boyd County, as verified by the lack of exceedances of the SO_2 NAAQS, is due to the implementation of permanent and enforceable reductions.

Most recently sulfur dioxide emission limits and operating restrictions have been imposed on Calgon Carbon Corporation by the issuance of a Title V permit, a facility that contributes to the nonattainment status. This permit (*Appendix H*) was issued August 21, 2000, with a final revision date of March 1, 2004, and lowers the allowables as described in the following section, "Emission and Operating Caps Description." The Statement of Basis for the permit is provided in *Appendix I*. Sulfur dioxide emissions were modeled with all the control measures in place. The data show modeled attainment of the SO_2 NAAQS.

In addition, Catlettsburg Refining, L.L.C. is undergoing a project entitled the Refinery Modernization Project, which involves operational and emissions limitations.

EMISSION AND OPERATING CAPS DESCRIPTION:

CALGON CARBON CORPORATION, CATLETTSBURG, KENTUCKY:

Emission limits were revised for the following points based on the source's request to reduce the allowable SO2 emission limits down to the potential to emit levels:

Section B, EP 12 (B-08, 09) B-Line Baker Heater.
The emission limitation in paragraph 2.b. was changed from 1.33 lb/mmBTU to 0.0853 lb/mmBTU.

Section B, EP 14 (B-04) B-Line Activator.
The following emission limitation in paragraph 2.c. was added: "Emissions of SO_2 from the B-Line Activator shall not exceed 2.88 lbs/hr and 12.6 tons during any consecutive 12 months [401 KAR 53:005, and Permit V-00-015 (Revision 2)]."

Section B, EP 21 (C-04, 05) C-Line Activators.
The following emission limitation in paragraph 2.c. was added: "Emissions of sulfur dioxide from both C-Line Activators combined shall not exceed 7.72 lbs/hr and 33.8 tons during any consecutive 12 months [401 KAR 53:005, and Permit V-00-015 (Revision 2)]."

Section B, EP 24 (M-02) Package Boiler.
The emission limitation in paragraph 2.b. was changed from 1.33 lb/mmBTU to 0.0861 lb/mmBTU.

Section B, EP 26 (M-04) Acid Wash Process.
The following emission limitation in paragraph 2.b. was added: "Emissions of SO_2 from the Acid Wash Process shall not exceed 1.278 lb/hr [401 KAR 53:005, and Permit V-00-015 (Revision 2)]."

Section B, EP 32 (D-12, 13) D-Line Baker Heaters.
The emission limitation in paragraph 2.b. was changed from 1.33 lb/mmBTU to 0.0853 lb/mmBTU.

Section B, EP 39 (E-02) E-Line Baker Heaters.
The emission limitation in paragraph 2.c. was changed from 4.62 lb/mmBTU to 0.191 lb/mmBTU, and from 333.0 tons during any consecutive 12 months to 65.7 tons.

Section B, EP 40 (E-09, 10) E-Line Baker Heaters.
The emission limitation in paragraph 2.b. was changed from 1.33 lb/mmBTU to 0.477 lb/mmBTU. This is a weighted emission rate based on the simultaneous combustion of #2 fuel oil and natural gas in the E-Line Baker Heaters.

Section B, EP 42 (E-05, 06) E-Line Activators.
The following emission limitation in paragraph 2.c. was added: "Emissions of SO_2 from *each* E-Line Activator shall not exceed 7.5 lb/hr and 65.7 tons during any consecutive 12 months [401 KAR 53:005, and Permit V-00-015 (Revision 2)]."

The operating limitation was revised for the following point based on operating scenarios provided by the source that were used in modeling to determine NAAQS attainment for the area:

Section B, EP 40 (E-09, 10) E-Line Baker Heaters.
In order to enforce the removal of the five oil fired burners, the following statement was added to paragraph 1., operating limitations:

> As per the revision application (Log # 55679), the heat-input rating will be accomplished through the removal of five (5) #2 fuel oil fired burners. This results in the permitted operation of twenty-one (21) oil fired burners and four (4) natural gas fired burners for the E-Line Baker Heaters.

See the Calgon Corporation Statement of Basis (*Appendix I*) and Title V permit (*Appendix H*).

As a result of the described revisions, the actual (821.9 tons per year) and potential (821.9 tons per year) emissions listed in the original Title V permit were reduced in the Revision 2 permit (*Appendix* H*)* to 121 tons per year actual emissions and 226 tons per year potential emissions.

CATLETTSBURG REFINING, L.L.C., CATLETTSBURG, KENTUCKY:

The Refinery Modernization Project involves installation of new equipment and upgrading of existing equipment. This will allow the refinery to produce cleaner-burning transportation fuels, to improve yields, to utilize a wider range of purchased feed materials, and to reduce fixed and operating costs. In addition, the project will substantially reduce emissions of sulfur dioxide from the refining operations.

After the installation of new emissions units, modifications to some existing emissions units, and removal of some existing emissions units, the total past actual emissions from the existing units and the future potential emissions from the future units are as follows (change in emissions with revision 2 are listed in parentheses):

Pollutant	Potential (tpy)	Actual (tpy)
PM	370 (-0.7)	335.5
PM10	370 (-0.7)	335.5
SO_2	4,525.2 (-1.2)	773.2
NOx	1,847.4 (-1.8)	929.1
CO	1,194.8 (-3.7)	1,148.7
VOC	205.1 (-0.2)	167.8

The refinery Statement of Basis is attached in *Appendix J* and the revised permit is in *Appendix K*.

IV. Section 110 and Part D Requirements

The nonattainment plan provisions (including plan items) under CAA Section 172 (c) required to be submitted under this part shall comply with each of the following:

a. ***RACM*** – This submittal includes modeling data demonstrating that the applicable area in Boyd County has achieved attainment of the SO_2 NAAQS with the control measures fully implemented at this time. The DAQ has determined that the control measures and lower allowables in the permits satisfy the RACT requirements of the CAA. The permit for Calgon Carbon Corporation ensures implementation of these enforceable control measures. Ambient air monitoring results demonstrate that Boyd County has maintained the SO_2 NAAQS since 1975.

b. *RFP* - EPA's reasonable further progress requirements stipulate annual incremental reductions in SO_2 needed to assure attainment of the SO_2 NAAQS. This is not required because this submittal demonstrates attainment of the SO_2 NAAQS at this time and projected inventories (Appendix F) demonstrates emission levels will stay at or below the modeled levels.

c. *Inventory* – An inventory of SO_2 emissions in Boyd County and the entire tri-state area (contiguous parts of Kentucky, Ohio, and West Virginia) is provided in the air dispersion modeling analysis included in *Appendix F* with this SIP revision.

d. *Identification and Quantification* – "Such plan provisions shall expressly identify and quantify the emissions, if any, of any such pollutant or pollutants which will be allowed, in accordance with section 173(a)(1)B, from the construction and operation of major new or modified stationary sources in each such area …"

This information is unnecessary because the EPA Administrator in consultation with the Federal Secretary of Housing and Urban Development has not identified the area as a zone for which economic development should be targeted.

e. *Permits for new and modified major stationary sources* – Kentucky has an approved program (Title V, NSR, PSD) for new and modified stationary sources.

f. *Other measures* – The permits (*Appendices H and K*) provide the required emissions limitations, operating requirements, and compliance schedules, where appropriate.

g. *Compliance with Section 110 (a) (2)* – All of the applicable provisions of § 110 (a)(2) are already required by the provisions listed above.

h. *Equivalent techniques* – Kentucky DAQ requested that EPA approve the use of the AERMOD non-guideline model in a letter dated October 20, 2003 (*Appendix D*). EPA Region 4 approved AERMOD for this application in a November 12, 2003, letter from the regional administrator (*Appendix E*).

i. *Contingency measures* – The General Preamble for the implementation of Title I of the CAA amendments published in the *Federal Register* on April 16, 1992 (57 FR 13498) (*Appendix G*), states that SO_2 SIPs present "special considerations" when referring to contingency plans. As stated in the Preamble (57 FR 13547), the modeling of SO_2 sources is considered reliable for predicting the amount of SO_2 emitted from sources in the nonattainment area. There is not such a confidence level with other pollutants. Also, the Preamble states that control measures for SO_2 emissions are "well understood and far less prone to uncertainty." Therefore it will be unlikely for an SO_2 area to implement emission controls but fail to attain the NAAQS. For the reasons stated above, EPA concluded that contingency measures in SO_2 SIPs are unnecessary where a comprehensive program exists in the state "to identify sources of violations of the SO_2 NAAQS and to undertake an aggressive follow-up for compliance and enforcement." The DAQ has comprehensive enforcement and compliance programs. All measures in the permits and the SIP are implemented prior to redesignation of the area to attainment. Therefore, this submittal does not contain contingency measures. However, if violations of the SO2 standards are monitored in the future, Kentucky will take expeditious action to perform culpability analyses and will take appropriate regulatory action.

V. Public Participation

A public hearing to receive comments on the SIP revision for the Kentucky portion of the Huntington-Ashland, WV-KY-OH, MSA, sulfur dioxide attainment area was held on January 26, 2005. A copy of the public hearing notice is included in *Appendix L.* The Statement of Consideration of comments received will be included in *Appendix M* after the public hearing.